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(71) Applicants (*for all designated States except US*): **O.D.F. OPTRONICS LTD.** [IL/IL]; Toyota Towers, 65 Yigal Alon Street, 67443 Tel-Aviv (IL). **SPHEREVIEW LTD.** [IL/IL]; Toyota Towers, 65 Yigal Alon Street, 67443 Tel-Aviv (IL).

(72) Inventors; and

(75) Inventors/Applicants (*for US only*): **GAL, Ehud** [IL/IL]; 3 HaGalil Street, 71908 Reut (IL). **LITEYGA, Gennadiy** [IL/IL]; 28/15 Ben-Gurion Street, 78281 Ashkelon (IL). **GRAISMAN, Gil** [IL/IL]; 33 HaGalil Street, 71908 Reut (IL).

(74) Agents: **LUZZATTO, Kfir** et al.; Luzzatto & Luzzatto, P.O. Box 5352, 84152 Beersheva (IL).

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(54) Title: OMNI-DIRECTIONAL IMAGING AND ILLUMINATION ASSEMBLY

(57) Abstract: In a first aspect, the present invention provides an omni-directional imaging assembly. In the preferred embodiment the assembly of the invention comprises a solid omni-directional lens comprising a vertical axis of symmetry; an upper surface, at least part of which is capable of reflecting rays that arrive from the inner side of the omni-directional lens; a transparent perimeter surface; a lower convex surface, at least part of which is capable of reflecting rays that arrive from the direction of the perimeter surface; and a transparent circular surface maintained in the lower convex surface around the vertical axis of symmetry. The light rays from a first 360 degrees, panoramic, scene are refracted by the transparent perimeter surface, are then reflected by the lower convex surface towards the upper surface, and then reflected by the upper surface towards the transparent circular surface, where they are refracted and exit the omni-directional lens. In a second aspect the omni-directional imaging assembly of the invention can be combined with an illumination source to simultaneously provide both omni-directional imaging and omni-directional illumination. Also described are embodiments of the invention that comprise image capturing devices, embodiments that enable simultaneous imaging of the first scene and a second scene, and embodiments that are adapted to the requirements of endoscopic imaging.